SECTION 07600

FLASHING AND SHEETMETAL

PART 1 GENERAL

1.1 SUMMARY Furnish and install all Architectural sheet metal flashing, trim and specialties as shown or specified.

1.2 REFERENCES Comply with Section 07002

1.3 SUBMITTALS

The following shall be submitted in accordance with Section 01300, "Submittals:"

SD-33, Fabrication/Erection/Installation Drawings

Drawings shall indicate the location, dimensions, and configuration of all specified sheetmetal; construction details; type of seams; joints; fastening method; material description and thickness.

SD-76, Certificates of Compliance

1.4 DELIVERY, HANDLING, AND STORAGE: Package and protect materials during shipment. Uncrate and inspect materials for damage, dampness, and wet-storage stains upon delivery to the job site. Remove from the site and replace damaged materials that cannot be restored to like-new condition. Handle sheet metal items to avoid damage to surfaces, edges, and ends. Store materials in dry, weather-tight, ventilated areas until immediately before installation.

PART 2 PRODUCTS

2.1 SHEETMETAL MATERIALS

2.1.1 Aluminum

Unless otherwise specified, sheet and strip aluminum shall be Alclad 3003, Alclad 3004, or Alclad 3005 conforming to ASTM B209M, embossed finish, clad one side and specified temper. Minimum tensile strength shall be 23,000 psi.

2.1.2 Lead

Lead flashing and lead washers shall conform to FS QQ-L-201, Grade B, weighing 4 pounds per square foot.

2.1.3 Galvanized Steel

Galvanized steel sheet shall conform to ASTM A526/A526M, regular coating, designation Z90.

2.1.4 Copper

Copper shall be standard electrolytic tough-pitch copper, Type ETP, or fire-refined tough-pitch copper, Type FRTP, as classified in ASTM B224 and conforming to ASTM B370, light cold-rolled temper.

2.1.5 Stainless Steel: Stainless steel sheet shall conform to ASTM A 167, Type 302 or 304, 2D finish, fully annealed, dead-soft temper.

2.1.6 Lead-coated copper sheet: ASTM B101

2.1.7 Zinc Sheet and Strip: ASTM B 69, Type I, A minimum of 0.024-inches thick.

2.2 FASTENERS

Fasteners shall be the same metal or a metal compatible with the material joined.

2.3 SOLDER MATERIALS

Solder and flux shall meet the requirements of ASTM B32. Solder shall be SN50.

2.4 CEMENTS AND SEALING COMPOUNDS

2.4.1 Bituminous Plastic Cement

Bituminous plastic cement shall be an asphaltic-base material conforming to ASTM D2822, compatible with the roofing asphalts and asphalt primer.

2.4.2 Sealing Compound

Sealing compound shall be gun grade, one- or two-component, nonsag, elastomeric, conforming to ASTM C920; the base material shall be polysulfide, resistant to 50-percent joint movement.

Aluminum-seam sealant shall be as recommended by the aluminum manufacturer.

2.5 Accessories: Suitable for purpose, of dame kind of material to which applied or a material compatible with sheet metal.

PART 3 EXECUTION

3.1 GENERAL

Sheetmetal work shall conform to drawing details and to the applicable plate number and design and installation recommendations of SMACNA-02. The finished sheetmetal installation shall be free from water leakage.

Surfaces to receive sheetmetal work shall be clean, smooth, dry, and free from defects and projections which might affect the work. Surfaces shall be plumb and true to a tolerance of not more than 1/2 inch in 40 feet, with no dips, waves, or uneven surfaces exceeding 1/8 inch in 10 feet in any direction. Lines, arises, and angles shall be sharp and uniform. Exposed edges of sheetmetal shall be folded back to form a 1/2-inch-wide hem on the concealed side. Make sheet metal exposed to the weather watertight with provisions for expansion and contraction.

3.1.1 Fastening Methods

Fasteners shall be concealed. Only one edge shall be nailed to permit freedom of expansion perpendicular to the line of nailing. Nails shall be spaced at not more than 3 inches on center and approximately 1/2 inch from edge unless otherwise specified or indicated. Nails shall penetrate backing by not less than 1 inch.

Cleats shall be used for securing edges of sheetmetal members over 12-inches wide and at other designated locations. Cleats shall be fastened with two nails and the end folded over the nails. The other end of the cleat shall be locked into the seam or the folded edge of member being fastened. Cleats shall be spaced at not more than 12 inches on center.

Screws shall be fitted with neoprene or lead washers to protect surface of metal sheet and provide a watertight connection.

3.1.2 Minimum Dimensions and Thicknesses

Materials shall be not less than the SMACNA-02 minimum thicknesses and weights.

3.1.3 Seams

Seams and lock joint construction shall conform to SMACNA-02, Plate 131.

Seams shall be straight and uniform in height, width, and finish as follows:

Flat-lock seams shall be not less than 3/4-inch wide.

Lap seams, when soldered, shall finish not less than 1-inch wide.

Lap seams, not soldered, shall overlap not less than 3 inches.

Loose-lock expansion seams shall be not less than 3-inches wide and shall provide for not less than a 1-inch movement within the joint. The joint shall be completely filled with the specified sealant applied at not less than 1/8-inch bed thickness.

Flat seams shall be made in the direction of flow. Seams not soldered shall be completely filled with plastic cement.

Joints and seams shall be soldered. Surfaces to be joined shall be cleaned, pretinned, heated, fluxed and sweat-soldered through the full contact area. Flux residue and foreign matter shall be removed after soldering.

3.1.4 Provisions for Expansion and Contraction

Expansion-joint configuration shall conform to the drawing details.

Expansion joints in concrete walls shall conform to SMACNA-02, Plate 82, Figure B. Each member shall not exceed 10 feet in length and shall run continuously from the top of the footing to the top of the wall.

Floor slab expansion joints shall conform to SMACNA-02, Plate 83. Joints shall be lapped 3/4 inch and soldered prior to installation in the concrete floor slab.

3.1.5 Dissimilar Metals

a. Separate dissimilar metals with heavy-bodies bituminous paint, caulking, non-absorptive tape, gaskets or other similar acceptable methods.

b. Where drainage from a dissimilar metal passes over aluminum, paint the dissimilar metal with non-lead pigmented paint.

3.2 FLASHING

3.2.1 Reglets and Flashing Receivers

Reglets and flashing receivers shall conform to the drawing details. Reglets shall be located a minimum of 8 inches and maximum of 14 inches above roof surface with cant strips, unless otherwise indicated. Coordinate work with other trades to assure proper locations and installation. Rake out mortar joints in existing masonry to receive reglets.

Ends shall be butted or lapped according to manufacturer's directions.

3.2.1.1 Metal Reglets: Caulked type or friction type reglets shall be factory fabricated with a minimum opening of 1/4 inch and a depth of 1 1/4 inches, as approved.

3.2.1.2 Caulked Reglets: Provide with rounded edges and metal strap brackets or other anchors for securing to the concrete forms. Provide reglets with a core to protect them from injury during the installation. Provide built-up mitered corner pieces for internal and external angles. Wedge the flashing in the reglets with lead wedges every 18 inches, caulked full and solid with an approved compound.

3.2.1.3 Friction Reglets: Provide with flashing receiving slots not less than 5/8 inch deep, one-inch jointing tongues, and upper and lower anchoring flanges. Insert the flashing the full depth of the slot and lock by indentations made with a dull-pointed tool.

3.2.1.4 Polyvinyl Chloride Reglets: Rigid polyvinyl chloride reglets may be provided in lieu of metal reglets for temporary construction.

Single-pipe vents shall be flashed with a two-piece formed-metal housing of the specified sheetmetal, installed per the drawing details.

3.2.2 Cap and Counter Flashing

3.2.2.1 Base Flashing: Extend up vertical surfaces of the flashing not less than 8 inches and not less than 4 inches under the roof covering. Where finish wall coverings form a counterflashing, extend the vertical leg of the flashing up behind the applied wall covering not less than 6 inches. Overlap the flashing strips with the previously laid flashing not less than 3 inches. Fasten the strips at their upper edge to the deck, with compatible, large-head roofing nails. Solder end laps and provide for expansion and contraction. Extend the metal flashing over crickets at the up-slope side of curbs, and similar vertical surfaces extending through sloping roofs, the metal flashings. Extend the metal flashings onto the roof covering not less than 4.5 inches at the lower side of dormer walls, chimneys, and similar vertical surfaces extending through the roof decks. Install and fit the flashings so as to be completely weathertight. Base flashing for interior and exterior corners shall be factory-fabricated.

3.2.2.2 Counterflashing: Except where indicated or specified otherwise, insert counterflashing in reglets located from 8 to 14 inches above roof decks, extend down vertical surfaces over upturned vertical leg of base flashings not less than 3 inches. Fold the exposed edges of the counterflashings 1/2 inch. Where stepped counterflashings are required, they may be installed in short lengths or may be of the preformed one-piece type. Provide end laps in counterflashings not less than 3 inches and make it weathertight with plastic cement. Do not make lengths of metal counterflashings exceed 10 feet. Form the flashings to the required shapes before installation. Factory-form the corners not less than 12 inches from the angle. Secure the flashings in the reglets with lead wedges and space not more than 18 inches apart: on chimneys and short runs place wedges closer together. Fill caulked-type reglets or raked joints which receive counterflashing with caulking compound. Caulking is covered in Section 07920, "Sealants and Caulking." Turn up the concealed edges of counterflashings built into masonry or concrete walls not less than 1/4 inch and extend not less than 2 inches into the walls. Install counterflashing to provide a spring action against base flashing.

3.2.3 Edge Strips: Hook the lower edge of fascias at least 3/4 inch over a continuous strip of the same material bent outward at an angle not more than 45 degrees to form a drip. Nail hook strip to a wood nailer at 6 inches maximum on centers. Where fastening is made to concrete or masonry, use screws spaced 12 inches on centers driven in expansion shields set in the concrete or masonry. Where horizontal wood nailers are slotted to provide for insulation venting, install strips to prevent obstruction of vent slots. Where necessary install strips over 1/16 inch thick compatible spacer or washers.

3.2.4 Flashing at Roof Penetrations and Equipment Supports

Metal flashing conforming to the drawing details, shall be installed where piping, conduit, or equipment supports penetrate roof surfaces.

Single-pipe vents shall be flashed with a two-piece formed-metal housing of the specified sheetmetal, installed per the drawing details.

3.3 GRAVEL-STOP FASCIAS

Gravel-stop fascias shall be installed at exposed edges of built-up roofs. The configuration shall conform to drawing details. The lower edge of each gravel-stop fascia section shall be secured in place by hooking over a continuous edge strip or cleat. Flanges of each section shall extend out on the top of roofing felts not less than 3-1/2 inches.

A 1/4-inch open joint shall be provided between each gravel-stop fascia section, with a 12-inch-wide plate centered on the joint.

3.4 GUTTERS AND DOWNSPOUTS

3.4.1 Gutters

Gutters shall be set level to a tolerance not to exceed 1/2 inch in 40 feet.

Gutters shall be pitched to drain at not more than 1/16 inch per foot.

Gutters supports shall be in accordance with drawing details. Support spacing shall not exceed 30 inches on center.

Back edges of gutters shall be folded to form a continuous hook not less than 1/2-inch deep. Gutters shall be supported by continuous cleat of not less than a 2-1/2-inch width.

Outlet tubes with flanges shall be riveted and soldered to gutters; tubes shall be extended 3 inches into downspouts.

A downspout strainer shall be inserted into each outlet tube.

Gutter expansion joints shall be provided at a spacing of not more than 32 feet on center in accordance with SMACNA-02, Plate 6.

3.4.2 Downspouts

Downspouts shall be provided on outside walls from gutters, conductor heads, and scuppers.

Downspouts shall be joined to the gutters at outlet tubes and joined to each other by telescoping end joints 1-1/2 inches into the lower section.

Downspout hangers shall be fabricated of the same material as downspouts. One hanger shall be provided at the top and bottom of each downspout section.

Elbows shall be installed where downspouts terminate on splash blocks or roof pans. Downspouts shall be fitted neatly into cast-iron boots or drain pipes where downspouts terminate in drainage lines; joints shall be filled to the full height of the bell with portland-cement mortar caps.

3.5 CLEANING

Exposed sheetmetal work shall be cleaned at completion of installation. Grease and oil films; handling, scratch, and solder marks; and steel wool, filing, and drilling debris shall be removed and the sheetmetal work scrubbed clean.

3.6 REPAIRS TO FINISH

Scratches, abrasions, and minor surface defects of finish may be repaired in accordance with the manufacturer's printed instructions and as approved. Repair damaged surfaces caused by scratches, blemishes, and variations of color and surface texture. Replace items which cannot be repaired.

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